

Claims:

1. Pantoprazole multiparticulates having reduced release under gastric conditions and fast release at neutral pH, wherein each of said multiparticulates comprises:

a spheroid core comprising pantoprazole or an enantiomer thereof, or a salt or hydrate thereof, at least one surfactant, at least one distintegrant, and about 1% to about 2% w/w water;

an enteric coat on the core, said enteric coat comprising a copolymer of methacrylic acid and methacrylates in the range of about 15 to about 45 % w/w of the spheroid core; and

wherein said multiparticulates have an average size of about 1mm in diameter.

2. The pantoprazole multiparticulates according to claim 1, further comprising a final seal coat on the enteric coat.

3. The pantoprazole multiparticulates according to claim 2, wherein the final seal coat comprises about 0.1 to 10 wt% of the multiparticle.

4. The pantoprazole multiparticulates according to claim 2 or claim 3, wherein the final seal coat comprises hydroxypropyl methylcellulose (hypromellose).

5. The pantoprazole multiparticulates according to any one of claims 1 to, wherein said multiparticle further comprises an initial seal coat on the core.

6. The pantoprazole multiparticulates according to claim 4, wherein said said initial seal coat is in the range of about 2 to 4 % w/w of the weight of the uncoated core multiparticle.

7. The pantoprazole multiparticulates according to claim 4 or claim 5, wherein the initial seal coat comprises hypromellose.
8. The pantoprazole multiparticulates according to any one of claims 1 to 7, wherein the surfactant comprises from about 2 to about 7% by weight of the uncoated core.
9. The pantoprazole multiparticulates according to any one of claims 1 to 8, wherein the surfactant is a polysorbate.
10. The pantoprazole multiparticulates according to claim 9, wherein the polysorbate is polysorbate 80.
11. The pantoprazole multiparticulates according to any one of claims 1 to 10, wherein the enteric coat comprises 27.5 to 32.5 % w/w of the multiparticulate.
12. The pantoprazole multiparticulates according to claim 1, wherein the enteric coating comprises about 30% w/w of Eudragit L 30 D-55 coating, about 15% w/w talc, about 3% triethyl citrate and a pH adjuster; said amounts being by weight of the microparticulate..
13. The pantoprazole multiparticulates according to any one of claims 1 to 12, wherein the pantoprazole compound is present in the range of from about 5 to 50 w/w, of the spheroid core.
14. The pantoprazole multiparticulates according to any one of claims 1 to 12, in which the core comprises pantoprazole compound in an amount equivalent to about 40 mg pantoprazole per 100 mg uncoated multiparticulate.
15. The pantoprazole multiparticulates according to any one of claims 1 to 15, wherein said spheroid core further comprises a pH adjuster and hypromellose.

16. The pantoprazole multiparticulates according to any of claims 1 to 15, wherein the disintegrant is selected from the group consisting of microcrystalline cellulose and crospovidone, and mixtures thereof.

17. The pantoprazole multiparticulates according to claim 16, wherein the microcrystalline cellulose comprises about 25 to about 30% by weight of the core.

18. The pantoprazole multiparticulates according to claim 16 or claim 17, wherein the crospovidone comprises about 14 to about 16% by weight of the core.

19. The pantoprazole multiparticulates according to claim 1, wherein the spheroid core consists essentially of:

pantoprazole sodium sesquihydrate	45 % w/w
microcrystalline cellulose	27 % w/w
polysorbate 80	5 % w/w
crospovidone	15 % w/w
hypromellose 2208	1 % w/w and
sodium carbonate	7 % w/w.

20. A pantoprazole formulation for use in dosing to pediatric patients, said formulation comprising a suspension comprising the pantoprazole multiparticulates of any one of Claims 1 to 19 and a physiologically compatible suspending liquid.

21. A capsule comprising the pantoprazole multiparticulates of any one of Claims 1 to 19.

22. A foil packet comprising the pantoprazole multiparticulates of any one of Claims 1 to 19.

23. A method of treating humans in need of pantoprazole, said method comprising the step of administering an effective dose of the pantoprazole multiparticulates of any one of Claims 1 to 19.

24. A method of producing a multiparticle formulation of pantoprazole, said method comprising the steps of:

producing a spheroid core comprising pantoprazole or an enantiomer thereof, or a salt thereof, a surfactant, a disintegrant, via extrusion and spheronization, said core containing about 1 to about 2% w/w water;

applying an initial seal coat to the spheroid core, said seal coat being about 1 % w/w to about 20 % w/w of the multiparticulate;

applying an enteric coating over the initial seal coat, said enteric coating comprising a copolymer of methacrylic acid and methacrylates in an amount that provides the multiparticulate with 15 to 45 % w/w dry enteric coating polymer; and

optionally applying a final seal coat to the enteric-coated spheroid core, said final seal coat being about 1 wt% of the multiparticulate;

wherein said multiparticulates have an average size of no greater than about 1mm in diameter.

25. The method according to claim 24, wherein the spheroid core is prepared by mixing the ingredients in a low shear mixer at low shear conditions at a range of about 25 rpm to 35 rpm.

26. The method according to claim 25, wherein the low shear conditions are 32 rpm.

27. The method according to claim 25 or claim 26, wherein the spheroid cores are dried at a low temperature not exceeding about 40°C for a period of 8 to 72 hours to a percent (%) loss-on-drying (LOD) of 3.4% to 4.3%.

28. The method according to claim 24, further comprising the step of applying an layer of talc in an amount of 0.05% w/w to 0.1% w/w of the multiparticulate.

29. The method according to claim 24, wherein the enteric coating is sprayed as a suspension onto the spheroid core.

30. Use of pantoprazole multiparticulates according to any of claims 1 to 19 in preparing a medicament.